

WORKPLACE SURVEILLANCE: PRINCIPLES AND PRACTICES

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OVERVIEW

Workplace Surveillance: Principles and Practices

- I. What is “Workplace Surveillance”?
- II. Current issues and challenges
- III. Looking ahead...

Basic premises

- Disease not randomly distributed
- Systematic assessment may identify patterns
- Patterns may be associated with risk factors
- Modifying risk factors may lead to effective intervention
- Future cases may be prevented

Motivation for prevention

- Occupational disease and injury cause suffering, disability and sometimes death
- Occupational disease and injury are enormously costly
 - To employees
 - To employers
 - To society
- Prevention reduces both suffering and cost



Why surveillance as a prevention tool?

- Potentially more rapid than other approaches, notably epidemiological studies
- Early intervention may result in greater levels of prevention
- Other benefits: containing costs; focusing additional data and research efforts

What is “Workplace Surveillance”?

CLASSIC DEFINITION ELEMENTS

- Systematic, ongoing data collection
- Analysis and interpretation
- Timely dissemination
- Leading to action / intervention

What is “Workplace Surveillance”?

- Different things to different people
 - Looking for and treating clinical disease
 - Monitoring exposure
 - Tracking occurrences of specific diseases
 - Examining outcomes by categories of risk
- Variety of related terminology
- Some consistent themes, or principles

Range of objectives and perspectives

- Workplace surveillance objectives vary by:
 - Type of employer/industry/materials
 - Regulation and laws
 - Economic conditions
- Objectives also may vary by perspective:
 - Management
 - Employees
 - Medical or HSE staff

Objectives and Perspectives

Employees Union Management Industry Government



INFORMATION RESOURCES



What is Workplace Surveillance today?

- Data and information management systems describing dynamic employee populations;
- Analyzed periodically to identify evidence of unusual exposure or disease occurrence;
- For purposes of rapid intervention in support of primary prevention and early treatment

“EPIDEMIOLOGICAL READINESS”

Surveillance theme

“In essence, it [surveillance] represents organically the brain and nervous system in a management process...” (D.A. Henderson, 1976)

- Information gathered
- Processing
- Action
- Evaluation
- New information gathered...

Data management is key



- Validity of results is function of ***quality of data***
- Various data sources can be increasingly easily linked
- Ability to derive results efficiently is dependent on ***database structure***
- Analytical processing and reporting can be automated

Who is responsible for surveillance?

Varies by industry / employer

- Medical department
- Health, Safety and Environment (HS&E)
- Product stewardship?
- Human resources?
- Management (local and/or corporate)?
- Health professionals may need to “sell” the idea to management

Workplace Surveillance: Principles and Practices

Part II: Current issues and challenges

- Surveillance design issues
- Evaluation of surveillance systems
- Standardization of methods

Design issues

- What data should be incorporated?
 - Are there risks or exposures of concern?
 - Are there associated outcomes?
- Existing data vs. new collection effort
 - Gathering new data can be expensive, difficult
 - Existing data often generated for other purposes

Surveillance database elements

CORE ELEMENTS

- Demographic data
- Employment / exposures
- Potential confounders
- Health outcomes
- Other...

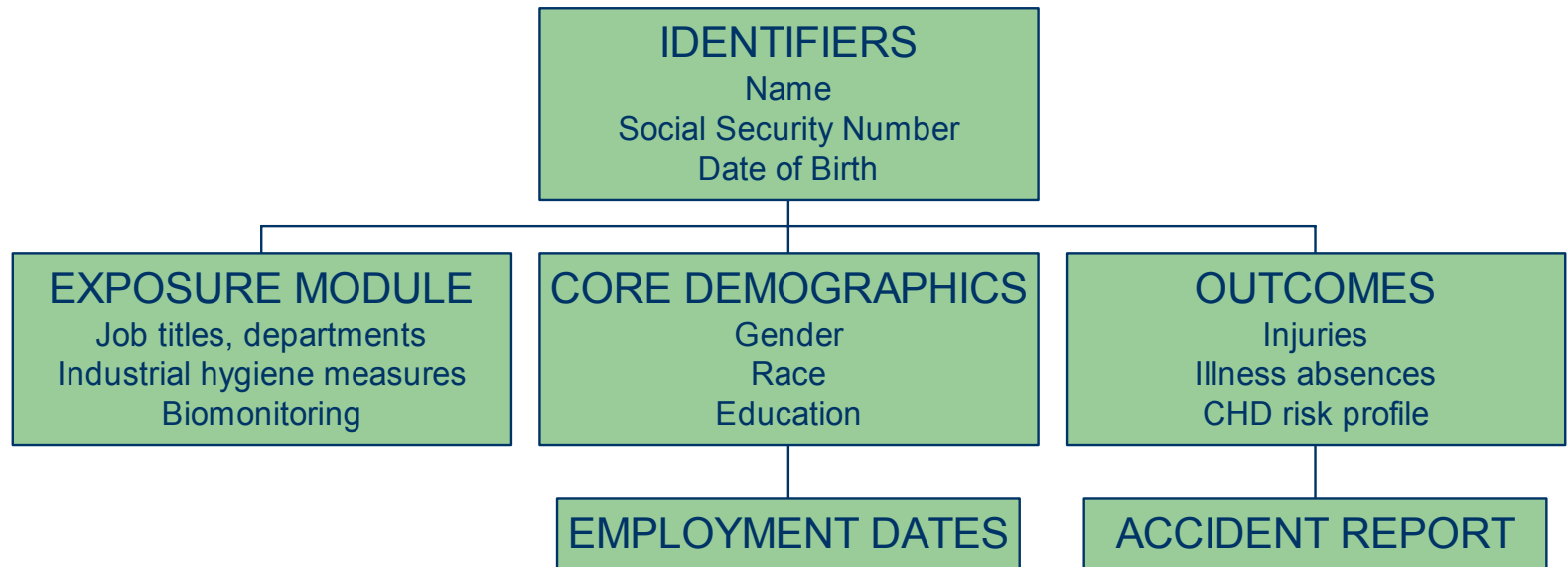
DYNAMIC ELEMENTS

- Grouping data
- Time
 - Latency
 - Risk period

Design issues

- The advantage of workplace surveillance is the ability to obtain DENOMINATOR DATA
- This enables rate-based surveillance
 - Requires demographic module
 - Work history (dates of hire, job change, separation)
 - Person-time can be calculated
- Counts of events can be expressed as rates

Basic relational database model



Expansion of basic structure

- Demographic and identifier data form core
- Data may be added to system as needed
- All possible data are **not** necessary:
 - Not possible to have comprehensive data
 - Focused collection of new data may be limited, as in case-control studies (cases and sample of controls)
- Efficiency is a key to surveillance

Surveillance Efficiency

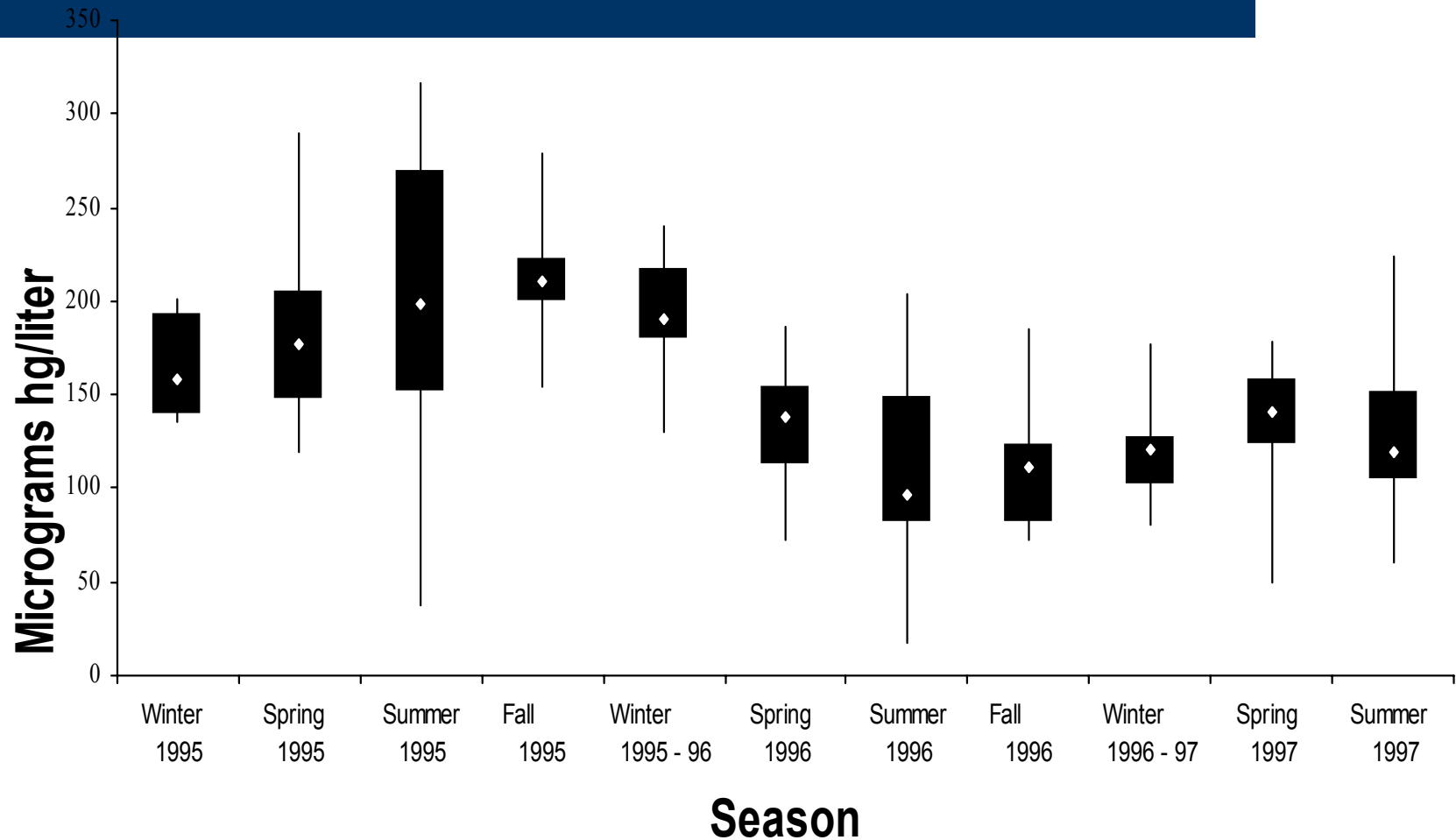
Theoretical model of efficiency vs. etiological value



Evaluating workplace surveillance

- What criteria should be used for evaluation?
 - Efficiency?
 - Effectiveness?
- Can success may be determined by the lack of measurable events or outcomes?
- Outcomes must be adequately ***sensitive***
- Most convincing evidence is reduced outcome occurrence relative to baseline, previous time

Example: Urinary mercury over time



Pitfalls and obstacles to success

- Lack of “surveillance question”
- Over-ambitious data needs: “warehousing”
- Inability to act/react
- Not able to define “positive” finding
- Inadequate support / resources

Standardization of surveillance methods

- Overall design
 - Common database elements and structure
 - Power in larger numbers by combining databases
- Main risk factors and outcomes
 - Comparability of laboratory tests and results
 - Standard disease diagnostic categories (ICD)
 - Individual level exposure measures / indicators
- Interpretation and reporting

Workplace Surveillance: Principles and Practices

Part III: Looking ahead...

- Unmet surveillance needs
- Opportunities
- Future

Unmet surveillance needs

- Information technology has outpaced development of workplace surveillance
- Workplace surveillance has not been implemented in smaller places of employment
- Within larger organizations, support for surveillance has not been uniformly strong

Opportunities

- Design a surveillance management information system using latest information technology
- Develop web-based surveillance for small employers within industry sectors, incorporating basic but targeted outcome measures
- Cultivate supportive environment among large industries – enhance with marketing efforts

What should programs look like in the 21st century?

- Improved individual level data
 - Increased use of biomonitoring
 - Potential for genetic susceptibility tests
 - Legal and ethical challenges
- Emphasis more on data management and analysis
- Enhanced data linkage capacity
 - Dynamic systems
 - Flexibility
 - Immediacy
- Stronger protection and confidentiality assurances

Surveillance beyond the workplace

- There already is great potential for surveillance of customers, i.e., users of products
- Community-based surveillance already well established
- Extension of workplace surveillance to neighborhoods around manufacturing facilities might be beneficial

Potential for collaboration improving

- Private sector – public health partnerships
- Private sector – academia partnerships
 - Can provide methodological development
 - Especially needed for smaller companies
 - SBIR program opportunities for new tools
- Serious opportunity to design (commercialize?) information management analysis and reporting system

Parting image

